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ABSTRACT

A total of 21 single concept Super 8 millimeter films, each four minutes long, were made that offered an on-site view of selected mechanical, industrial, and service occupations. The occupations selected to be filmed were considered to have growth potential and to be open to non-college bound students. It was found that the films could be photographed by a graduate student directly on 8 mm. film according to a professionally prepared script with little or no editing. This was important because the first three films prepared by a commercial studio proved to be too expensive. The sound track for the films was tape recorded on a cassette. Starting the film projector and the tape recorder at the same time provided a sufficiently synchronized effect for instructional purposes. When the films were shown to some 1322 middle-school students, the majority of the students rated them as a good or excellent method of learning about occupations. The acceptance of the films varied somewhat with the sex of the student and the film content. The major criticism was the desire for more information. Their simple presentation form allowed the films to be used in an individualized instructional setting. (JY)

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PHASE I

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January 31, 1971

U.S. DEPARTMENT OF

HEALTH, EDUCATION, AND WELFARE

Office of Education

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FINAL REPORT

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This project was generated by a growing conviction of the project co-directors that youth need to know about the world of work early in life and would not have been possible without the help of many individuals who assisted in the task of bringing this project to reality.

Those who gave initial encouragement and consultation as the project developed were Dean Carl Dolce of the School of Education; Dr. Durwin Hanson, Head of the Department of Industrial and Technical Education; Dr. William Hopke, Head of the Department of Guidance and Personnel Services; - all at North Carolina State University - and Dr. Joseph R. Clary, Executive Director of the North Carolina State Advisory Council in Vocational Education and Dr. William Brown, Director of Research of the North Carolina State Department of Public Instruction.

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Finally, we must acknowledge gratitude to Mrs. Barbara Watkins and Mrs. Faye Dent who performed the typing and other services essential in completing this project.

SUMMARY

The purpose of this project was to develop, produce and field test a limited number of single concept super 8 film loops of selected mechanical, industrial, and service occupations. The literature relative to the use, development and production of 8 millimeter films was researched through analysis of ERIC titles, library research and personal correspondence. A large number of sources were located, although very little was discovered on the use of single concept films to teach occupations. By analysis of publications of the North Carolina Employment Security Commission, Bureau of Employment Security Research, the Department of Labor and selected reports on job clustering, a series of occupations were selected for filming. Local contacts were then made through interviewing techniques to identify specific jobs, locations and individuals. Three films were made by a commercial studio following recommendations derived from the research. However, costs were prohibitive, and the remainder of the films were produced by a graduate student working directly on 8 millimeter film. Twenty-one films were completed, together with scripts and informative materials.

The films were evaluated for format, content, and grade placement by selected teachers of Occupational Information in North Carolina and Mississippi. They were field tested in selected Introduction to Vocations classes in North Carolina and Occupational Orientation classes in Mississippi to determine the feasibility of the cartridge projector and cassette recorder technique as an individualized instruction method and to identify the acceptance of the technique for youth to learn about occupations.

An analysis of the responses of 522 youths in North Carolina and 800 youths in Mississippi indicated that the technique was considered good or excellent by the majority of the students as a method of learning about occupations and as individualized instruction.

General observations were that students found no difficulty in using the projector and recorder technique, would have like more information about the occupations and their future, and tended to be less interested in films of occupations considered more appropriate for the opposite sex.

Conclusions

On the basis of the study it was concluded that the method is an effective means of disseminating occupational information to youth in the middle school but does not supplant other methods.

Recommendations

Planning should be started to develop Phase II of the project which would provide a larger number of films for a statewide evaluation. More information should be developed to accompany the films and

it is suggested that the films be produced directly on super 8 millimeter film by teachers of occupational information in conjunction with consultants.

Evaluation techniques should include measures to identify the occupational information content retained by the students.

CHAPTER I

Introduction

Background of the Study

There is no doubt about the importance of providing information about occupations, their requirements and opportunities for individuals of all ages. This information is important for those special groups such as the disadvantaged, those who are changing work responsibilities, and particularly for those who are at the age in which they may be ready to make tentative occupational choices. It is also generally agreed that information about occupations, their requirements and opportunities, is essential for youth to aid them in the development of the ability to make wise occupational choices, and that knowledge about jobs does affect vocational choice. The current urgency for methods to provide information about world and work situations is evidenced by the wealth of information available for counselors in the form of slides, film strips, written materials, 16 millimeter films, television programs, and packaged programs within the public schools. There is little doubt as to the efficiency of the use of audio visual media as a means of imparting information for instructional purposes. Evidence of this is the emphasis that was placed on the use of films in the schools in the early thirties and the lavish use of films by the armed services in World War II. Current efforts include a study in progress at the University of South Carolina in which a series of twelve 30-minute films on occupations are to be produced and transmitted by the South Carolina Educational Television, and a similar project in Georgia directed by Dr. J. E. Bottoms, Associate State Director of Vocational Guidance, as well as the existence of some 5,000 instructional film titles of 12-30 minute length (Holliday, letter).

However, these media appear to be more appropriate for large group audiences and in general require the use of sophisticated and expensive equipment. It would seem that the use of a media designed to utilize low cost instructional materials, low cost and easily obtainable projection and sound equipment, and which also provides individualized instruction within the classroom would be highly desirable as a method of disseminating occupational information to youth in the middle schools. Since the 8 millimeter film loop had been identified through initial library research as effective but neglected teaching tool, the investigators believed that the development of 8 millimeter single concept film loops of selected occupations would provide a means for individualized instruction in occupational information.

Purpose of the Study

The purpose of this study was to investigate the use of the 8

millimeter cartridge film as an effective method of disseminating occupational information to youth in the middle schools. This was to be accomplished in two phases: Phase I, which includes the development, production and field testing of a limited number of 8 millimeter film loops of selected mechanical, industrial, and service occupations, and Phase II, projected as the development, production, and statewide evaluation of a larger number of films dependent upon the recommendations resultant from the completion of Phase I and the availability of funding. This report is only concerned with Phase I.

Specific Objectives

The specific objectives of the study were as follows:

1. To review the literature and research related to development, production, and use of 8 millimeter films as instructional media.

2. To identify a series of jobs in selected mechanical, industrial, and service occupations which afford potential job opportunities and entry possibilities for non-college bound youth.

3. To develop and produce a limited number of 8 millimeter single concept film loops that depict job functions and opportunities in these jobs.

4. To develop instructional materials to serve as a guide for the use of the films in providing occupational information for groups and individual instruction.

5. To evaluate the completed films and instructional materials for accuracy of content and use as an instructional media by selected audio visual and educational consultants.

6. To field test the single concept film loop in Introduction to Vocations classes in the middle school to investigate student acceptance.

7. To provide information relative to the developmental procedures and costs involved in the production of 8 millimeter occupational information film loops for facilitation of further research.

8. To provide recommendations for the duplication and dissemination of the 8 millimeter film loops and instructional materials for subsequent statewide evaluation in selected industrial arts and

introduction to vocations courses as Phase II of the project dependent upon the results of the evaluation.

Procedure

A plan of action or description of activities was developed and a PERT network made to permit accomplishment. The procedure initially designed was as follows:

Step 1. Review the literature and research relating to the use of films as instructional media. This is to identify the general effectiveness of audio visual media as an instructional technique and the existence of such media of any type specifically designed for the dissemination of occupational information.

Step 2. Investigate the development, production, and utilization of 8 millimeter single concept film loops. This should result in the selection of the most appropriate techniques pertinent to completion of the project.

Step 3. Identify a sequence of related jobs in mechanical, industrial, and service occupations which have growth potential and which could provide entry for non-college bound youth. This will be accomplished by review of the Dictionary of Occupational Titles, review of manpower and employment projections as noted in federal and state publications, and the suggestions of guidance and employment agency consultants.

Step 4. Conduct interviews with workers who perform the jobs in the selected occupations. Graduate students from the Department of Guidance and Personnel Services of the University will be trained. These interviews will be performed after approval by the employers concerned and should result in a job content description.

Step 5. Review the content of the interviews with writers who will develop the script for production of the film loops.

Step 6. Provide the scripts to employers and guidance personnel for review of accuracy of job description and inclusion of necessary job information.

Step 7. Prepare a filming schedule and produce 16 millimeter color films of selected jobs. Edit the films and reduce to 8 millimeter single concept film cartridges. Narration and background sound track will be added.

Step 8. Develop instructional materials as a guide for film content and use.

Step 9. Provide film cartridges to selected audio visual and guidance personnel for evaluation as occupational information materials.

Step 10. Provide films to selected classes in occupational orientation for field testing.

Step 11. Analyze information and prepare recommendations for further research and initiation of Phase II.

Step 12. Submit final report.

These procedures were generally followed and are reported in the section entitled, Methodology.

CHAPTER II

REVIEW OF THE LITERATURE

While no attempt has been made to completely analyze the voluminous literature in the area of audio visual media and the application of such techniques for instructional purposes, research was conducted to furnish a basis for the development of the initial proposal and the directions to be taken in the single concept film development and production.

Audio visual materials have been used for many years based on the assumption that people learn primarily from what they perceive and that the eyes and ears are primary methods of establishing effective communication and transmitting ideas. Although materials for this purpose take many forms, no attempt has been made to review the entire field of the use of such media for instructional purposes. The review has been limited primarily to the single concept film loop.

EIGHT MILLIMETER FILM IN INSTRUCTION

The 8 millimeter film cartridge, presenting a single concept which can be repeated, appears admirably suited for instructional purposes. Sleeman and Crosswhite (1968) suggested the use of 8 millimeter films to teach functional activities, modern languages, speech reading to deaf children, speech correction and for job training programs for mentally retarded. Painter (1961), reporting on the use of authentic and unrehearsed classroom films in lieu of direct classroom observation, believed that the usage saved a great deal of student time, allowed for a larger viewing group than could be accommodated in the classroom and allowed for more intelligent student discussion because of common observation. Similarly, Wright and Cumming (1966) filmed teaching demonstrations early in the student teaching periods as a training device, and as an evaluation technique near the end of the term. Such films economically provided short visual records at the crucial part of the teaching presentation and allowed the bulk of the class time to be used for work, thinking, and routines -- not teacher activity. A series of 20 films were used by Beberman and Van Horn (1960) in demonstrations in teacher education for a new high school mathematics curriculum, and provided information which enabled forecasts of difficulty in teaching subject units to be made more accurately than when forecasts were based on live demonstrations.

Aside from the usage of short films as a diagnostic tool in the development of teacher competency in the teaching process, the advantages for teaching content and concepts to the student in the classroom appear to lie in the simplicity of the use of the film, the ability to review it when it is devised and the adaptability of the use of this technique to maximize individualized instruction. Some advantages are that the

8 millimeter film avoids the need to stop a longer film in order to transmit concepts, (Ingraham, 1966), enables the child to study what he wants when and where he wants (Finn, 1962), and enables students to "think visually." Other advantages of the 8 millimeter film loops are said to be low cost of production (Brown, 1964; Evans, 1966; Gaffney, 1962; Miller, 1965) and the immediate accessibility to both student and teacher as opposed to the difficulties of obtaining the longer 16 millimeter films (Williams, 1964; Miller, 1965: Forsdale, 1962).

Additional advantages are said to be in the low cost of producing the films either originally or as film clipping, the flexibility of storage and use, and the reduced costs of equipment required.

Fowler (1967) summarized the use of 8 millimeter films as appropriate for filmed experiments in the laboratory, as did Schofield (1966) and for self-instructional purposes providing for repetition, enrichment, and remedial or tutorial use.

The need for the production of 8 millimeter occupational films is highlighted by a review of the catalogs of audio visual materials. Although there are over 3,000 current titles, only two references were located which were concerned with the use of the 8 millimeter loops for occupational study. (Higgins & Brown, 1963; Laramore, 1968)

Development and Production of 8 Millimeter Films

A review of the literature on the development, production, and utilization of 8 millimeter films disclosed numerous articles in professional journals and four particularly useful reference source materials. These are: a book, Planning and Producing Audio Visual Materials by Jerrold Kemp, a pamphlet, Movies With a Purpose published by the Eastman Kodak Company, a report, Production and Use of Single Concept Films in Physics Teaching and a pamphlet, Guidelines to Preparation and Evaluation of Occupational Films, a publication of the National Vocational Guidance Association.

Since these materials are so readily available, no attempt is made to reproduce the information in detail, but a brief summarization of the most important topics follows. Additional information is provided in Appendix.

Methods of Production

The production of 8 millimeter film loops may be accomplished in two general ways: "film clipping" or production of an original film then used to make duplicate copies or shown directly without duplication. The method of "film clipping" in which sections of longer films are clipped and put together to make a duplicate film, does not appear to be a very acceptable method, and does not apply to the films considered in this

study. When original films are made they may be produced directly as 8 millimeter color films or in 16 millimeter and then reduced to 8 millimeter.

The direct production of 8 millimeter films costs less but lacks in clarity and quality. The use of 16 millimeter and subsequent reduction enables prints to be made from the original and results in the technical quality which is suggested by the National Vocational Guidance Association's Film Guideline Committee (1966).

Personal correspondence with audio visual personnel supported the theory of the investigators that 8 millimeter film loops to portray selected occupations should be carefully planned and professionally produced, and of no longer duration than 3-4 minutes (R. Polito, Jerrold Kemp, Robert Heinich and Dennis Pitt). They concluded that the best approach in a complex problem is to utilize knowledgeable consultants, and reduce the film from 16 millimeter film. Excellent information on this topic is provided in the referenced source material (Kemp, Fowler) and the publications available from Eastman Kodak (See Appendix). A list of representative film laboratories providing film services is in Appendix.

A brief listing of some of the information located about film production centered around the need for 8 millimeter films (Steen, 1969), planning procedures (Kemp and Szumski, 1968; Weisgerber, 1962), equipment selection (Dutton, 1964; Kemp and Szumski, 1968; Fowler, 1967) filming techniques, relative costs and problems of film duplication (Olsen, 1966; Wright, 1966; Brown, 1964). The possibility of sound was discussed by Finn and Rosengren (1962). The preparation of magnetic sound tracks is described in an article published by Bell and Howell (1965).

Since so much material is so readily available, the review of the literature is not at all conclusive. However, a brief review of the procedures, together with the comments of the script writer and photographer for the project, are found in Appendix.

CHAPTER III

METHODOLOGY

The project was funded on November 1, 1969. Two graduate students joined the staff later in November to assist with the research of the literature and the interviewing which is an integral part of the project.

Mr. Raymond Podell, a graduate working toward the doctorate degree in the Department of Industrial and Technical Education, brought a background of industrial experience to the project staff. Mrs. Marie Capell, a graduate student in the Department of Guidance and Personnel Services, had extensive experience in personnel work. They appeared to be excellently suited for the project and their performance in basic research and the necessary interviewing of State and industrial management personnel substantiated this belief.

Review of Research

The review of the literature and research relating to the use of films as instructional media and the development, production, and utilization of 8 millimeter film was accomplished through investigation of ERIC sources and subsequent review of dissertations, publications, and correspondence. The reports available through the ERIC system were searched by computer and resulted in approximately 100 titles. An analysis of these yielded only nine which were of specific use to the project. Literature representative of the audio visual media production and utilization provided a wealth of generalized information on the development, use, and evaluation of films, filmstrips, and slides as aids to instruction and as instructional techniques. Although the 8 millimeter single concept film is relatively new, no difficulty was experienced in locating information sources, which have been extensively reported in Chapter II.

As a result of the review of the literature which indicated that the 8 millimeter cartridge film was considered to be an effective learning tool, and its stated advantages as a method appropriate to individualized instruction, it appeared that the development of film for the dissemination of occupational information was well warranted.

Equipment Selection

One major problem was that of selecting a projector and sound equipment which would be low in cost, provide for ease of student operation and a minimum of maintenance.

A review of the literature, coupled with visits by the staff to audio visual equipment dealers and correspondence with companies and individuals disclosed three general approaches:

1. A cassette recorder and a cartridge projector, utilizing verbal instruction to signal the student when to start the projector.

2. A synchronizing tape recorder coupled to a conventional cartridge projector.

3. A complete sound video unit.

This last method, though more convenient, provides a tape cartridge which accommodates up to 400 feet of tape (30 minutes), and costs approximately $400 to $500.

Audio visual experts and projector equipment specialists were consulted about the feasibility of synchronizing a cassette tape recorder with a small cartridge projector. They informed the investigators that synchronization was not possible due to the variance in motor speeds of film projectors and tape recorders. (Letter, Holliday) Although this is generally true, it was decided to attempt this approach since the filming of occupations does not require a close synchronization of action and sound as in films about processes. The desired goal was reasonable synchronization through a generalized approach in the writing of the script and the retaping of the cassette tape by a master tape recorder with a pause control. Two cassette tape recorders were purchased to facilitate the interviewing requirements of the next project step and subsequently in the evaluation and field testing process. The projector selected was the Technicolor 810, which permits super 8 format and cartridge film insertion. The cassette recorder chosen was the Panasonic Model.

Identification of Selected Occupations

The second major task was to identify a tentative series of jobs and job clusters which have growth potential and provide entry capability for non-college bound youth.

The criteria which were identified for consideration of jobs to be filmed were as follows:

1. The job or job cluster should show a percentage increase in the number of job openings.

2. There should be an increase in job openings both state and nationwide. This was included in consideration of the mobility of the work force.

3. The job or job clusters should be those in which there is an appreciable pay differential between the trained and untrained individual and a progression is discernible.

4. There should be an indicator of growth stability as shown by trend performance over more than one year.

5. There should be clear channels for acquiring the education and training required for entering and advancing in the occupation.

Initially, the publications of the North Carolina Employment Security Commission were analyzed. This provided information on total employment in occupations within the state, number of unfilled openings in occupations due to lack of qualified applicants, average weekly earnings by occupation and projected employment requirements.

These figures were then related to the national statistics by review of the Occupational Outlook Handbook. The educational paths were identified by review of the progress reports of the Department of Community Colleges and information obtained from the Department of Labor about apprenticeship programs. Individual interviews were conducted with selected professors from the Department of Economics, North Carolina State University, the Executive Director of the State Advisory Council on Vocational Education in North Carolina, the Bureau of Employment Security Research and the State Personnel Department.

The occupations initially identified for filming were machinist, automotive mechanic, carpenter, construction electrician, clerical, and sales. The occupation of machinist was selected because it was one of a family or cluster of occupations which included all round machinist, machine tool operator, tool and die maker, instrument maker, and layout men, all grouped under the classification of metal machining and metal working, as classified by the North Carolina Bureau of Employment Security Research, or under the classification of machining occupations as used in the Occupational Outlook Handbook. Of these occupations in the cluster, machine tool operators and all round machinists showed the greatest potential growth.

Automotive mechanics, as a part of the occupational grouping or cluster of mechanical, or machine repairmen was considered one of the fastest growing occupations nationally. The carpenter and bricklayer showed the greatest anticipated growth in demand in the construction industry, with comparable strength in the forecastfor construction electricians, clerical, and sales occupations. The specific jobs identified which appeared to have the greatest potential were machinist, auto mechanic, construction electricians, and stenographer-secretary.

Filming Procedure

A procedure was established to identify selected industries, business, state, and federal agencies to locate suitable filming locations and to secure the cooperation of the managers, supervisors, and foremen as appropriate within these occupations. It was believed essential that the chain of approval be through the supervisory personnel.

A general description of an occupation was to be written based on information available from research sources. Then personnel were to be contacted in their respective business, industry, and agency, and suggestions requested in the review or modification of the job description according to actual practice. This procedure was to result in a written script, to be approved by the management and to establish a filming schedule. In order to facilitate this procedure, a series of discussions relative to interviewing techniques were conducted by Dr. Roy Anderson, Professor of Guidance and Personnel Services at North Carolina State University with Mr. Raymond Podell and Mrs. Marie Capel, who were responsible for interviewing business and industrial personnel to arrange for occupational filming. Response to the project was very gratifying and specific job descriptions were completed for the secretarial, clerical, metal working, and machining occupations. In the secretarial job cluster, medical, legal, and executive secretarial positions were included, as it was the viewpoint of the project staff that the effectiveness of the films might be dependent upon not only job activities, but also upon job environment. Based on the results of the review of the literature and the advice of audio visual consultants, a commercial film studio was contacted to produce a series of film loops. These were the machinist, secretary, and auto mechanic. Each film loop was produced on 16 millimeter color film, and reduced to 8 millimeter size. Two prints of each film and the original were produced. This was far short of the number which was originally projected based on early estimates of cost by the studio. The actual cost was so high that it was necessary to consider an alternate method of producing the requisite number of films for the project. Contact with a number of other studios resulted in the same high estimates of $2,000 for the production of three cartridge films and two copies of each film.

Inasmuch as the basic research was already accomplished on a series of occupations and contacts for filming had already been established by the staff, a graduate student, with some experience in filming, was added to the staff to make a series of films directly on 8 millimeter film. A tripod was purchased, and a camera located for the filming.

The first approach to the film production was that of the "trial film" in which a trial film is made on 8 millimeter film and additional footage is shot to provide a film which is then reviewed and used as the basis of a script. It was soon discovered that this procedure wasted film and time, as well as requring a second visitation of the work or occupational setting.

Industrial scenes required the use of a filter which permitted adjustment of the lighting to the fluorescent ligh prevalent in industrial situations.

A professional script writer was then engaged and scripts carefully prepared and time before filming was attempted. The cameraman, script writer, and the staff member who performed the original research and planned the schedule met with the management and discussed occupational filming prior to the actual scheduling of the filming operations.

This approach was highly effective. The script writer, Mr. Elber Reid, and a student-camera man, Mr. Walter Timm, were well received. Comments by Mr. Reid and Mr. Timm have been included in Appendix I to indicate the degree of acceptance and to explain the procedure of filming in detail.

Films were completed for the carpenter, bricklayer, executive secretary, sales clerk, auto mechanic, machinist, secretary (state agency), operating engineer, construction electrician, computer programmer, and legal secretary. Additional scripts were written for the all round machinist, jewelry sales clerk, cosmetic sales clerk, medical secretary, licensed practical nurse, cosmetologist, dental hygienist, over-the-road truck driver, and dental technician and filming was completed.

Information about these jobs was then developed and an evaluation form and a procedure devised for use of the film cartridge projector and the tape recorder.

Evaluation Procedures

The design of the evaluation procedure included an in-process evaluation of the film content and format to develop films consistent with current knowledge of occupations and the type of content which should be provided youth at the exploratory stages of career decision-making. This procedure was then followed by a general review of the completed films to furnish information as to the adequacy of content, format, and usefulness as to grade placement as seen by guidance and teaching personnel.

In-process evaluation was accomplished by consultation with guidance and audio visual personnel and by advice and counsel give by Dr. Joseph R. Clary and Dr. William Hopke. A form was developed, based largely upon suggestions contained in the publication "Guidelines to Preparation and Evaluation of Occupational Films" (1966) and was used in North Carolina and Mississippi to sample the opinions of 16 teachers of occupational information in Mississippi and of 8 teachers in the North Carolina program of Introduction to Vocations and of guidance and personnel members of the faculties of the North Carolina State University and the University of Southern Mississippi.

Eight teachers in North Carolina viewed five different films; those in Mississippi viewed two different films. Table I reports the total response of the evaluators in the categories listed. A list of the participating evaluators is to be found in Appendix IV.

TABLE I

TEACHERS OF OCCUPATIONAL INFORMATION AND INTRODUCTION TO VOCATIONS
EVALUATION OF 8 MILLIMETER FILMS

Content: Part I	Adequate No.	Adequate %	Inadequate No.	Inadequate %	Style and Format Part II	Adequate No.	Adequate %	Inadequate No.	Inadequate %
1. Activities and duties of worker	72	100	0	0	1. Length of film	65	90.3	7	9.7
2. Job setting or environment of work	71	98.6	1	1.4	2. Implications for motivating students	65	90.3	7	9.7
3. Qualifications required education or training	60	83.3	12	16.7	3. Basic Information	69	95.8	3	4.2
4. Personal rewards to the worker	49	68.1	23	31.9	4. Structure of film	71	98.6	1	1.4
5. Opportunities for advancement	48	66.7	24	33.3	5. Quality of picture	71	98.6	1	1.4
					6. Sound quality	69	95.8	3	4.2

Part III: Recommendations. Recommended age - grade level: all spaces appropriate were to be checked.

	No.		No.		No.
Primary (1-3)	6	Junior High School (7-9)	56	Special	18
Intermediate (4-6)	10	Senior High School (9-12)	72	Adult	25
Middle School (5-9)	40	Disadvantaged Students	33	College	7

The evaluators were also asked to give their opinions of the films according to general impression, whether or not they would recommend the film, and what applications or changes they might suggest. This information has not been included in this report.

The majority of the evaluators recommended the films, but a small number (6) considered the films useful instead of highly recommended or recommended, referring to their specific teaching situation. The films were considered as motivational for youth, and comments which suggested more information was needed indicated that the films should be preceded by some information about occupations and should be used as parts of a continum about occupations as originally planned.

Representative comments of interest were:

. . . This film was very good.

. . . It was very helpful to a person interested in this occupation.

. . . I believe it offers enough material to motivate a student to find out more about the occupation . . .

. . . Very good.

. . . Could be very effective.

. . . This film did not impress me (machinist film) possibly because I am a woman.

. . . This film was very impressive (stenographer). (The last two comments by the same individual.)

The design of the project also included a field testing of the films in the public schools of North Carolina, and when the opportunity arose, a similar testing in Mississippi. Although the project was originally planned only for North Carolina, the investigators believed that a broadening of the field test procedure would provide a non-regional evaluation.

Two different techniques were utilized. In North Carolina, teachers of Introduction to Vocations classes in Smithfield Junior High School, Johnson County, North Carolina; Goldsboro Junior High School, Goldsboro, North Carolina; Franklinton Junior High School, Franklin County, North Carolina; and teachers in Madison County Schools made the films and cassettes available to the students. They then observed the reactions of the students to the films and the self-use of the cassette recorders in conjunction with the films. In this manner, 522 students had the opportunity to use the technique and self-instruction. No difficulty was discovered in this procedure after minimum instruction. The teachers reported a high degree of acceptance of the technique.

It was observed, however, that girls tended to be less interested in the films on "machinist" and "auto mechanic," while the boys expressed similar attitudes toward the films on the "secretary."

In Mississippi, a series of films were shown to 800 students in North, South, East, and West Junior-Senior High Schools of Jones County. The films were shown to students in the seventh, eighth, ninth, tenth, and eleventh grades. A form was used to identify student reaction to content, the use of film and recorder as a technique for individualized instruction and as a means of learning about occupations. Additional questions were included to determine the type of exposure students had to similar audio visual media and obtain open-end comments.

Although forms were completed by all grades, only the data from the seventh, eighth, and ninth grades is reported in Table II. Copies of the forms are found in Appendix II.

The method planned for presentation of the materials was to provide a super 8 millimeter cartridge projector, a back view screen and a cassette tape recorder. A "Y" cord with a line switch was initially to be used to permit both projector and cassette recorder to begin simultaneously. In actual practice it was found that this was not necessary. A brief instruction on the use of the projector and recorder was sufficient for teachers and students to begin the film and sound together (See Appendix II.) as a delay or pause had been inserted in the tape cartridge to delay the sound until after the title and introductory material had been shown. A second modification was used. In order to gain a larger exposure for field testing, tapes for three of the films were recorded on a standard size reel to reel tape recorder and the films were shown to eighth grade students in a classroom situation. The larger recorder was necessary to provide sound quality acceptable for a class. It is to be noted that questions 7 and 8 were not answered by students who viewed by this method since these questions were not applicable to this technique. This modification did, however, provide information on an additional technique of using the cartridge films.

Table II describes the reaction of the students to content, Table III describes the response to the method as a learning technique, and Table IV the exposure to media and general comments.

TABLE II

ANALYSIS OF MISSISSIPPI STUDENT RESPONSES ACCORDING TO GRADE IN SCHOOL

Questions	Grade	Yes		No		Undecided		No Response	
		No.	%	No.	%	No.	%	No.	%
1. Was the setting of the job shown in the film?	7th	57	78	5	6.8	4	5.5	7	9.6
	8th	564	84.3	42	6.3	35	5.2	28	4.2
	9th	148	79.1	24	12.8	11	5.9	4	2.1
	Totals	769		71		50		39	
2. Were the training and experience necessary to successfully perform in this occupation described?	7th	49	67.1	15	20.5	3	4.1	6	8.2
	8th	483	72.2	124	18.5	62	9.3	0	0
	9th	158	84.5	24	12.8	5	2.7	0	0
	Totals	690		163		70		6	
3. Was information given concerning the educational preparations necessary for this job?	7th	46	63	26	35.6	1	1.4	0	0
	8th	424	63.4	191	28.6	48	7.2	6	.9
	9th	121	64.7	46	24.6	18	9.6	2	1.1
	Totals	591		263		67		8	

TABLE II (Cont'd)

Questions	Grade	Yes		No		Undecided		No Response	
		No.	%	No.	%	No.	%	No.	%
4. Was information given on the employment opportunities?	7th	33	45.2	27	37.0	5	6.8	8	11.0
	8th	282	42.7	230	34.8	114	17.2	35	5.3
	9th	86	46.0	78	41.7	15	8.0	8	4.3
	Totals	401		335		134		51	
5. Was information given about the future outlook of this occupation?	7th	16	21.9	42	57.5	9	12.3	6	8.2
	8th	241	36.0	291	43.5	96	14.3	41	6.1
	9th	88	47.0	79	42.2	20	10.7	0	0
	Totals	345		412		125		47	
6. Was the film long enough to show what you wanted to know about this occupation?	7th	25	34.2	32	43.8	15	20.5	1	1.4
	8th	389	58.1	209	31.2	43	6.4	28	4.2
	9th	104	55.6	68	36.4	12	6.4	3	1.6
	Totals	518		309		70		32	

The questions were designed to identify the students' response to the content of the films. It is to be noted that the films were apparently successful in defining the job setting and the training and experience necessary to successfully perform the job, and somewhat less in the area of information concerning the educational preparation required. The films were not considered too successful in providing information about employment opportunities, length, and future outlook. This might have been expected since salaries and exact job locations would date a film as they are subject to change. Since the film was not designed to cover a complete occupational cluster, but instead was planned for one segment of an occupational cluster, the response could be expected.

Some implications of this for future film development might be that a complete series should be available and that they be used together with the written information about the occupation which has been developed.

TABLE III

RESPONSE TO THE METHOD AS A LEARNING TECHNIQUE

Questions	Grade	Excellent		Good		Fair		Poor	
		No.	%	No.	%	No.	%	No.	%
7. This film as a method for individualizing instruction on career information was:	7th	9	12.7	37	52.1	21	29.6	4	5.6
	8th	95	22.6	215	51.1	100	23.8	11	2.6
	9th	43	23.8	86	47.5	49	27.1	3	1.7
	Totals	147		338		170		18	
8. This film as a method of learning about occupations was:	7th	7	10.6	39	59.1	15	22.7	5	7.6
	8th	97	22.1	219	50.0	108	24.7	14	3.2
	9th	34	18.8	93	51.4	52	28.7	2	1.1
	Totals	138		351		175		21	

TABLE IV

RAW SCORES TO INDICATE EXPOSURE

Question	Grade	Written Material		Slides		Film Strips		Records	
		No.	%	No.	%	No.	%	No.	%
9. Mark the spaces listed if you have learned about occupations by any of the following methods:	7th	56	23.6	58	24.5	63	26.6	60	25.3
	8th	510	24.6	472	22.7	573	27.6	522	25.1
	9th	101	21.4	146	30.9	138	29.2	88	18.6
	Totals	667		676		774		670	

% = Percentage of total number of responses

10. In the space below, please describe your feelings about the use of this film as a method of learning about occupations.

The responses to the questions in Table III indicate that the majority of the students classified the film technique as good or excellent. No difficulty was experienced in student use of the equipment.

Table IV was included only to identify whether or not students in this age grouping had prior exposure to various media, and substantiates the assumption that they have had exposure to all methods. The responses to the question 10 could not be tabulated, inasmuch as they were expressing general impressions of the use of single concept films for disseminating occupational information. The comments followed the percentage of the responses received in questions 7 and 8, but did provide some additional insights which paralleled the general response observed in North Carolina.

Boys generally did not like the films about the stenographer or sales clerk, noting, "It's all right if you are a girl," and girls showed a similar feeling about the film on the auto mechanic and the machinist, tending to find the film less valuable. Comments about the films included "I like it very much," "It is a very good way to learn about occupations," to "I thought the girl was very cute" which might indicate a different reason for finding a film interesting.

CHAPTER IV

OBSERVATIONS, CONCLUSIONS, RECOMMENDATIONS

Observations

The technique of using a cartridge film projector and a cassette tape recorder for sound was not difficult for students to use when minimal instructions were provided. The acceptance of the films varied, however, dependent upon the sex of the youth and the film content. Students believed them to be good, but desired more information to be included. There was no difference in the student response to the commercially made film compared to the ones produced by the graduate student, which has implications for future projects.

Conclusions

The 8 millimeter single concept film cartridge is an effective means of disseminating occupational information, but is not a substitute for other methods and techniques. It should be used as part of a job family series, and additional information should be provided with it to clarify the job family or ladder concept. Film planning must be carefully done, scripts developed before filming operations are begun to save time and expense. When these practices are followed, films excellent for educational purposes can be made directly on 8 millimeter film.

Recommendations

A series of films in selected occupational clusters should be produced and provided for statewide evaluation as Phase II. The films should be developed by teachers of Occupational Information and Guidance and Personnel to broaden their understanding of the world of work through the necessary research and contacts required to arrange for this filming. Occupational information to accompany the films should be developed to a greater degree to permit the films to be well used within the context of an integrated program of providing occupational information to youth. The evaluation of the films should be planned to include a comparison of information received through the development of a test procedure to determine the degree of information retained about specific occupations.

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APPENDICES

Appendix I

Methods of Film Production

Reid's Report

Timm's Report

Script for the Film, "All Round Machinist"

METHODS OF FILM PRODUCTION

Since materials relevant to the development and production of 8 millimeter films are so readily available, no attempt is made here to provide information in detail. General suggestions are included together with the observations of the script writer for the project and the photographer.

Methods of Production

The production of 8 millimeter film loops may be accomplished in two general ways: "film clipping" or production of an original film which then used to make duplicate copies or which can be shown directly without duplication. The method of "film clipping" in which sections of longer films are clipped and put together to make a duplicate film, does not appear to be a very acceptable method. (Miller 1967)

Film Planning

Both subject and length of film must be considered in film planning, together with a review of the needs, characteristics, and background of the audience or individual users of the film. The final step in the preliminary planning is to outline the subject content that supports the objective and will serve as the basis for film scenes. This may require some research as well as visits and interviews with people concerned in this concept, and should result in a precise statement of objectives for the film.

A film script or shooting outline should be used to organize both the text or title and demonstration if a demonstration is to be used in the film. This is usually accomplished by the "Story Board" technique. In this process content is organized into story-telling form and visually produced as a series of sketches that pictorially show the sequences described in the treatment. Finally, the script is prepared. It is based on the treatment and the story board and consists of listing of specific scenes to be filmed with accompanying narration (if to be a sound film). Each scene has a description of content and indication of camera position.

Equipment

An excellent discussion of equipment selection is to be found in the research by Fowler (1967), and should be consulted, together with individual correspondence with equipment manufacturers because of the rapid change in technology. Equipment can be grouped under the category of equipment for film making and projection equipment.

For the production of 8 millimeter film directly, the basic equipment includes a camera, lights, a tripod, lens filters, film splicing equipment, editing equipment, and a light meter. There are many types of cameras on the market, ranging from approximately $30 to $1,000, but the film maker should expect to pay approximately $200 to $250 for one adequate for the task. Some general minimum requirements are that the camera should have an optical viewfinder to see exact limits of scene, a zoom lens to allow a wide selection of image sizes (electrically operated), and an electric eye which controls the aperture at stop settings.

In addition, a fast lens (F2 or better) through the lens reflex viewing, automatic exposure with manual override and a range of camera speeds are desirable. The tripod should be sturdy and have a reliable method of controlling height. A good light meter is useful even though the camera may have one built in. When it is necessary to have close-ups, shoot titles, or copy pictures, a built-in meter may give an improper lens diaphragm setting. An incident type light meter is preferred.

The lighting equipment should include at least four lamps mounted on tripod supports (375 - 500 watt) and several clip-on reflectors. A film splicer and viewer is necessary, as it is difficult to take a film without careful editing of scenes and sequences. In addition, a tape recorder with a precise control is important for editing taped narration, together with a good cassette recorder if the camera and equipment used do not permit sound on the film.

One of the primary considerations in film production is the number of films required. If several copies are needed, the original films should be produced on 16 millimeter or 35 millimeter film, then professionally copied to 8 millimeter size. The 16 millimeter film is the commercial ektachrome type and is designed for reproduction purposes. This process also involves the use of an inter-negative film and a subsequent reduction to 8 millimeter, and is recommended for quality and clarity. A list of laboratories which provide this service is found in Appendix.

Duplicate copies can also be made from the original 8 millimeter but the quality is often disappointing. The copy is somewhat grainy, colors are not true, and there is too much contrast, meaning that lighter colors become whiter and darker colors go black. However, although some color is lost, the films are quite adequate for instructional purposes that do not require intricate detail.

Filming

After determing the general approach to be taken, and after scripts are carefully reviewed, the filming should be carefully studied in

reference to the objectives defined for the film. A variety of shots should be planned, avoiding long shots and concentrating on medium and close-up shots. Definite, easy scene motions should be used, and transitions between scenes carefully developed to provide continuity. It is desirable to use sequences longer than actually required to provide for editing. Careful planning and shooting however in which the film is edited as shot by including all sequences as desired results in a film complete in one piece at the low cost.

One technique to aid in this process is the use of the trial or test run film, which greatly assists in making corrections prior to the completion of the film desired, and enables lighting and camera position to be checked.

Costs

Many references were located which listed the costs involved in film production. It should be remembered that costs of film and equipment are constantly changing, and that the true cost of the finished film also includes trials and errors and rejected film. Therefore the costs described are only suggestive. Costs for color film are given as $5 to $6 per cartridge (Olsen 1966), $1 to $3 per running minute (O'Connor 1967), $5.50 to $7 per unit, with $1.50 to $3 extra for sound (Brown 1964). Kemp notes (1968) the cost of 16 millimeter commercial film as $13 per roll, and duplication costs for reduction to 8 millimeter as $15 per 8 millimeter foot. The subject of cost is a variable which can be viewed in many ways and will be dependent entirely upon the circumstances in which the films are made. Usually, however, direct filming in 8 millimeter is 1/3 the cost of 16 millimeter.

Projection Equipment

Projection equipment for 8 millimeter film includes reel to reel, and a newer development cartridge reel to reel as in the Kodak Ektographic projector. Projectors which take 8 millimeter cartridge films are of two major types: those which require a separate screen and those which have a built-in screen with/or without sound. The projectors which utilize sound and a built-in screen (Fairchild Mark IV, Mark V, Model 24, Jayark Super 8, and Technicolor, Super 8, Model 1000B, Model 1300,) have an 11 to 30 minutes cartridge with optical sound, and range in cost from approximately $365 to $500. The projectors which do not include sound range from $109.50 to $154 and include the Kodak Ektographic 120, Technicolor 510, the McLure 510, and the Technicolor 810. Cassette play back units and cassette recorders range from $19.95 to $39.95 for low cost units acceptable for individualized instruction. (Fowler 1967, pp. 49-53).

Cartridges for these units require loading and treating. Cost for these cartridges are from $6.60 to $9.95 per cartridge with a minimum of $4 for treating and $1.50 to $3 for loading (Fowler 1967).

To provide sound with a silent cartridge film there are several methods to synchronize a tape recorder and projector. Bell and Howell has a cassette recorder (model #450 - price $99.95) which can be used to coordinate with a projector to produce a sound movie playback. The recorder is electrically connected to the projector and cued (on a cassette tape) when to start and stop the film.

Another product manufactured to produce the same type of synchronized sound film playbacks is the Coxco/municator series XTM. This item is also cassette tape recorder but has several other features. Its price is approximately $175 and is available within two to six weeks after ordering. The Coxco recorder can be utilized (in addition to coordinating film projectors for sound) as a multiple choice teaching testing responder for punch card control and grading or to provide sound coordination with slides or filmstrips. To provide synchronized sound film projection, the Coxco/municator X cues the projector (from magnetic impulses on the tape) to start, pause, or start easily, and quickly.

There is a third programmer-recorder on the market by the Elco Optisonics Company. The models called Sound-O-Matic I or Sound-O-Matic III and feature identical characteristics of the Coxco/municator X described above. The prices for these units are unavailable at this time but should be comparable.

December 10, 1970

TO: Walter L. Cox, Jr., Assistant Project Director

FROM: Elbert Reid, Assistant Prof. of Agricultural Information

SUBJECT: Scriptwriting for Vocational Education Project

Having completed a series of scripts for the project, I want to share with you a few observations gained during the work. The people we worked with were without exception amazingly cooperative. They discussed their work with complete frankness. This was noteable because in most instances they had never before seen either me or Mrs. Utermohlen. We, of course, explained in some detail what we were trying to do and all expressed their belief that such films would be useful in the middle school, several citing their own children of that age as needing such information.

Secondly, they were genuinely pleased that people from the "college" were interested in what they were doing. They also looked forward to being "filmed" as most expressed that they had never been photographed before.

I would strongly recommend that students in vocational education be required to do such interviews at the job site as part of their college training. Personally, I have found this to be a rewarding and broadening activity which I have thoroughly enjoyed.

If the project is continued in the future, I would suggest that there are several factors you might want to consider in selecting someone to do your scripts. First, the person who intends to do this work must be firmly committed philosophically to the idea of the worth of all work. He must believe that socially constructive work is worthy of both his understanding and appreciation. He must recognize that skills, abilities, and even physical strength which he himself does not possess are worthy of admiration.

Secondly, he must be able to visualize the job situation in terms of its photographic possibilities. Some knowledge of or experience in the motion picture area would be invaluable. But at the same time he must be able to see what part of the work task might be interesting to young people. He must attempt to look at the job for those things which might produce wonder or surprise in young minds. And he must look for elements of the work which are not common knowledge.

Writing ability is, of course, important. But I believe it to be of secondary importance to these first two considerations. Anyone who can write a simple declarative sentence can do it. But anyone writing for this type of film must constantly remember that he is not writing for adults and that in three and one-half minutes you can't really give a great deal of factual information. Don't try to do too much.

Finally, anyone attempting this type of work must sincerely like people, all kinds of people. Any other attitude would be apparent to those being interviewed and interfere with the communications process.

In our society where social and educational pressures are pushing too many students in the direction of college, I firmly believe that greater efforts must be made to help young people find vocations for themselves which are satisfying to them and useful to society. I commend you and your associates for making these efforts in that direction. May I express my appreciation to you for allowing me to be a part of the project.

Recommendations for Film Project

by Walter H. Timm, Jr.

October 26, 1970

For

Carl Moeller

And

Walter Cox, Jr., Project Directors

RECOMMENDATIONS FOR FILM PROJECT

As the photographer in this film project, I have been in a fairly good position to see what conditions may cause delays in the smooth flow from preparation to completion of a particular film. My recommendations are biased because they are designed to aid me in the work of filming, but I think that it might prove interesting to look at the project from the photographer's viewpoint. Before I start with the list of recommendations, I would like to give my general impression of how the project has gone.

I was asked to join the project in July, 1970. Sincethen, I feel that we have made very good progress. When first instructed on the organization of the project, I learned that a research person was to list activities for a particular occupation and I was to film it. We have a four-minute limit on the length of the film, so if there is a list of ten activities for an occupation then each activity would be filmed for twenty seconds, thus leaving room for the credits. On the other hand, if there were more activities, the average time for each shot would be lessened. Since there was no script (there was a tentative description of the shot which could be modified to be a script) there was no way to tell which activity had priority over another or which one should be filmed for a longer time than another.

The first films were the "Legal Secretary" and the "Jig Grinder." After these were developed and criticized it was suggested that we should pay more attention to the surroundings of the worker than we have. A panned shot of the working conditions were suggested. It was also discovered that a filter to compensate for the fluorescent lights was needed. On the next film, the "Medical Secretary," all of these suggestions were put into effect. When viewed and criticized, it was decided that we should show how the people come to work in the morning. A shot of the person checking in was suggested. Also an introduction shot was suggested. This was a shot of the person, the place of employment, or the merchandise in the store. This was to aid the script writer in introducing the film. These suggestions were implemented in the "Executive Secretary" and the sales films. The introduction shot and the checking in for work shot were both intregal parts of the film. It was also suggested that we overshoot every activity so that in splicing we can use what we want. Hence, it usually took seven minutes of film for every four minutes wanted.

The next phase of the project was when we obtained a new researcher and a script writer. The process was now altered so that a <u>final</u> script was written with the <u>time</u> for each scene to be taken was given. I had learned from the first films that the directors wanted both hand manipulations and worker personality in the film so I knew at this time when to be close and when to take a full scene. This script method works much better because the time and scene order variables were

removed. In taking the finished script, I can now take the film in sequence to eliminate all unnecessary splicing. I have a time limit on each scene; hence, there is no need or cause to overshoot. If the film is done according to the script, it will be a finished product upon its processing. There are, however, a few problems which have developed and these will be brought out in the recommendations.

As a whole I would say that we have proved along quite well and that we have taken a positive attitude in learning from our mistakes. Now as for my recommendations for similar future projects:

1. It is necessary to have several group planning sessions before any scripts of filming is done. These brainstorming sessions would consist of everyone involved in the program and the purpose would be to get a clearer or at least similar view of what our goals for the project are. I think this would have helped tremendously in July. At times I didn't know whether I should film a close-up of hard skills or a full shot of the happy worker. I also had a different idea about the introduction to the film than some of my colleagues. Only through filming, processing, viewing, and then criticizing the film did I get a better idea of what was wanted. This is a long and costly process and I think we could have bypassed this phase of the project with planning sessions.

2. A script is necessary before the filming takes place. In this manner the directors have approved the story to be told and also the pictures to tell the story. In filming, the photographer can use the script writer's suggestions and his imagination to arrive at the best scene for the film. The photographer also has a suggested time limit so that he can gage his shots.

3. The script writer should describe his suggested film shots in the simpliest manner so that the photographer can follow his thought. For instance, to suggest a shot of a front-end loader is not enough. He should also include the explanation that it is a bulldozer with a scoop. In this manner, we both understand each other. There is a different vocabulary for each occupation and we should use it in the script, but in the description of the filmed scene, use common layman language so that we can understand each other.

4. In having a script before going out to film, the photographer knows the order and the length of the shots. The filming should be done in order so that there is little or no splicing. Splicing takes more time than you can believe. Time is money, and if splicing is eliminated, the costs are reduced. Allow me to illustrate my point -- in order to splice a seven-minute film down to four minutes,

it is necessary to have the following equipment:

a. a projector
b. a hand viewer (with crank)
c. a splicer
d. a splicing tape

With a script there is little need to do much more than to splice out mistakes, but if there is no script or time limits for each activity, there is a lot of splicing to be done. This is how splicing is done when there is no script. Using the splicer you should splice all of the mistakes and/or retakes out of the film. Then you must view it with the projector to obtain the overall length of the finished film. Now you know how much the film is over the four-minute limit. Next you view it again to time each and every activity. If they go over 30 to 40 seconds, then remember to splice some off. You will find some scenes last a full minute long of good material. Then there is a real problem of what to keep and what to splice. Another problem is that the splice should not look obvious because you want a smooth flowing film. Therefore, when you splice the end of a scene with the worker in action (moving his arms or body), it is best to start the next scene with the worker also in motion. If the end of a scene leaves the worker in an unmoving position it is best to splice in the next scene with him in a still position. This way the viewer does not notice the jump from one scene to another as much and the film has a smoother flow. In trying to find the place to splice, you use your memory as to which scene was too long and the hand viewer to find the position manually. Then remove the film, splice it, and tape it on the splicer. Return the film to the hand viewer and continue. When you have done as much as you feel you can, then view the film on the projector again, and time it. If it is still too long, the entire process is repeated again and again until it is spliced down to four minutes.

From this description of the splicing process, I think you can see where time, money, and the quality of the film can be better used if there is little or no need to splice.

5. There is a method by which we would not have to splice at all, and I would advocate using it. Have the credits made before the occupation is to be shot, and film them before the occupation is filmed. For example -- the credits of U.S. Office of Education, the directors names, and the title of the occupation should be filmed before and on the same strip of film that the rest of the occupation is to be filmed. In this manner when the film is processed, there is no splicing what so ever. Just have it put in a closed loop cartridge.

In summary, the project has gone very well. We were all new in the field of close-looped filming and we have progressed very well. We have learned from our mistakes and are now advancing in a more streamlined fashion.

SCRIPT FOR THE FILM "ALL ROUND MACHINIST"

NOTE: They want to do this on a Saturday when it will not interfer with production. They are thinking of using their supervisory personnel. So this one should be checked out carefully with them. They are willing to cooperate in any way, but should this script present problems, let me know about it and we will rework it.

TIME CUES	VIDEO	AUDIO
.00-.18	Get close up shot of bronze parts already machined and stacked along side each other on a pallet, ready to be picked up and put in supply area. Back off from close to middle distance.	These beautiful pieces of metal are the product of a very skilled man and very expensive machinery. They are the result of a machinist and a machine, one of the real foundations of our industrial society.
.18-.28	Shoot supply shelves. Start at front where round ends show and move to sides where the length will show.	Such beautiful parts start from such bars of metal as these, whether they are bronze or steel.
.28-.38	Overall shot of turret lathe and have it turning if possible.	Cut into smaller pieces, these bars are placed on machines such as these to be turned and cut into the desired shapes.
.28-.38	Show operator putting piece of metal in chuck and securing it in place. Use close up of hands. Ignore whole machine.	The machine operator has to mount the metal to be shaped in the chuck. This holds it in place as it is being cut to the desired proportions.
.38-.48	Show operator moving cutting tool of turret lathe into position to begin the operation of cutting into the metal. Hands turning wheels, moving cutting head up, etc.	Then he must place the cutting tools in proper position to do the job which is required for this particular part.

TIME CUES	VIDEO	AUDIO
.48-1.10	Close up of the machine shaving off the metal. Then quick shot of man looking at blueprint, and then with machine stopped, using the calipers, close in, but not close up, of his measuring part with calipers.	As the machine cuts the excess metal from the part to be made, the machinist must be able to interpret the blueprints which define the limits of the part in process. As the limits of its specifications are reached, he must use calipers to determine if it is reaching the design specifications.
1.10-1.25	Get close up shot of those with the welded material on them. Show in hands of man. One, highly polished & apparently acceptable, & another with flaws which are visible. (These are the 6-7 inch valve heads which Mr. Cadwalleder showed us being worked on.	Precision and accuracy are called for in the manufacture of machined parts. The operator must be able to distinguish between those parts which will be acceptable & those which have flaws in them.
1.25-1.45	Move over to the engine lathe. Show it cutting metal and then when machine is stopped his measuring the internal distances with the smaller gauges. Start from medium out and then close up on the hands.	As a machinist progresses in his skill and ability, he may be called upon to advance to such a machine as this engine lathe. This one makes holes in what may have already been cut and smoothed outside. Then he must know how to use such instruments as the depth & thread gauges.
1.45-2.00	Back off to middle distance & watch machine, especially metal turnings coming off. See operator too.	The machinist must have a knowledge of mechanical principals and the working properties of metals. And he must be constantly conscience of the factors which influence his own and others safety.

TIME CUES	VIDEO	AUDIO
2.00-2.15	Show crane picking up heavy part and swinging it into position on the machine. Show man moving chain or crank which lifts it.	In many metal working operations, it is necessary for the machinist to use devices which help him lift very heavy parts. He must know how to operate the overhead crane to bring his materials within reach of his machine.
2.15-2.35	Show operator at work trying to get casting in proper verticle alignment he puts casting on rig to be bored.	Machine operations which are parallel to the floor are relatively simple when compared to those which must be done from the verticle position. More skill is needed by the machinist who is going to work from a machine which bored from overhead. The problem of alignment is more acute. The problem of accuracy is greater.
2.35-2.45	Shoot boring mill in operation.	As a machinist moves from machine to machine, he is usually given both greater responsibility and higher pay. This of course depends on the type of company he is working for.
2.45-3.00	Move on to shots of verticle turret lathe operator at work. Try to film the differences in the machines. Have this one in full operation if possible.	In some parts of the country, machinists are members of a union. A young man entering the trade would do so through an apprenticeship program. Some companies train their own machinists & promote them from job to job as their skills increase.
3.00-3.15	Move back through sequence showing machines in backwards sequence all being worked if possible.	The earnings of machinists measure up well with other skilled factory workers in different parts of the country. Most work 40 hours per week with extra pay for overtime. Some, working shifts, may have to work at odd hours.

TIME CUES	VIDEO	AUDIO
3.15-3.30	Get in close to a machine then back out and look down row of several machines, probably the turret lathes.	In newer factories such as this, working conditions are both clean and comfortable. Young men wanting to become machinists should have machanical aptitude and a willingness to do work requiring concentration, accuracy, & physical effort.
3.30-3.40	Get in close to a machine again and show it peeling off metal from the casting.	For more information of being a machinists, see the person responsible for career guidance in your school.

Appendix II

Single Concept Film Loops for Dissemination of Occupational Information

Instructions for Viewing Single Concept Eight Millimeter Film Loops with Cassette Sound Recordings

Information for the Viewer about the Occupation, "The All Round Machinist"

Occupational Film Evaluation Form

Student Film Evaluation Form

SINGLE CONCEPT FILM LOOPS FOR DISSEMINATION OF OCCUPATIONAL INFORMATION

Introduction

You have been invited to participate in evaluating a different method of providing occupational information to youth in the Middle Schools.

This method consists of viewing a single concept motion picture film loop describing a specific occupation which is one of a cluster or family of occupations and listening to a cassette tape describing the occupation, educational requirements for the occupation and opportunities for growth in the occupation.

This method is not considered as a replacement for current films and materials describing occupations, but is an approach to provide individualized instruction, with low cost projection and sound equipment.

An information sheet describing how to use the cartridge projector and cassette recorder, and an information sheet about the occupation is included.

Please view the film and complete the attached evaluation form.

INSTRUCTION FOR VIEWING
SINGLE CONCEPT 8 MILLIMETER FILM LOOPS
WITH CASSETTE SOUND RECORDINGS

Introduction

The projector is a technicolor super 8 millimeter projector. The "ON" and "OFF" switch is located at the top right of the projector. Focusing may be done by turning the lens to left or right. The cassette recorder will have a play, stop, and rewind button. Since these tapes have been clipped, there is no hazard of recording or erasing the tape.

Instructions

Step 1. Insert the cartridge in the super 8 movie projector, flat side forward. It can only be inserted one way.

Step 2. Insert the cassette tape in the recorder provided with tape toward you.

Step 3. Start the projector by turning right hand knob on top of projector to "ON" - depress "PLAY" on cassette recorder to start the tape. There will be a delay as the sound is timed to begin after the film identification is complete.

Step 4. When film has been shown and tape is completed, turn off projector and press "STOP" button on recorder.

Step 5. If you wish to see the film again, rewind the tape by pressing "REWIND" button. Stop the projector.

Step 6. Repeat steps 3 and 4. If the film and tape are not exactly synchronized, the cartridge film may be stopped by pushing the "STILL PICTURE" button on the top of the projector.

Step 7. Complete the evaluation form and turn it in.

THE ALL ROUND MACHINIST

The all-round machinist is a skilled worker, setting up and operating stationary power-driven machine tools, cutting, drilling, boring, turning, milling, planning, and grinding to very accurately form metal into a certain shape or size. In some cases, the cutting tool is moved and the metal is held stationary. The machine tools most commonly used are lathes (turning and shaping), grinding machines (smooth), drilling (make holes) and boring (enlarge holes already drilled) machines, milling machines (cut or remove excess metal), shapers, broachers, and planners (produce flat surfaces). All-round machinists have wide knowledge of shop practices, mechanical principles and working properties of metals plus an understanding of what the various machine tools do. Recently, new metal shaping techniques have beendeveloped that use chemicals, electricity, magnetism, sound, light, and liquids under controlled conditions.

The products made from separate metal parts vary from large motors, to typewriters; in fact, almost every product made by American industry uses metal parts or is manufactured by machines made of metal parts. These parts must be machined to precise dimensions -- so accuracy is of prime importance for metal machining. It is important that parts be interchangeable and easily assembled for mass production. Machinists follow blueprints or drawings specifying exact dimensions of finished parts. The blueprints are read, the proper machine set up, the proper cutting tools are selected and speed and feed controls are set according to the type of metal used in the product. Micrometers, gages, scribers, calipers, verniers, and scales are some of the precision-measuring instruments used to check accuracy of work to tolerance of thousandths and even millionths of an inch.

Precision handwork such as laying out and assemblying metal parts is also a part of the work of the skilled tool and die maker, instrument maker, machinist and layout man. Files, scrapers, and emery cloths and other small hand tools are used to file, scrape and polish the parts for exact fit and final assembly. The all-round machinist's work is varied and sometimes complex. Standards of accuracy are generally high, giving the conscientious skilled worker a sense of satisfaction.

Machinists find employment in most factories using a substantial amount of machinery. Work can be found in practically every locality in the United States. Machinists are needed to keep the mechanical equipment operating. Industries using a lot of all-round machinists are: electrical, transportation equipment, fabricated metal products, primary metals, railroad, chemical, food processing, textiles, and the Federal Government.

Machinery workers make up the largest occupational group in the metal working trades. In 1967, more than one million workers were employed in the machining trades. A moderate increase in the need for

all-round machinists is expected throughout the 70's due to expansion of metal working activities. However, most job openings will arise from a need to replace experienced machinists who retire, die or transfer to other work. These new jobs will come mainly in industrial maintenance shops caring for a greater number of complex machinery and equipment in order to prevent costly breakdowns where machine tools are often linked together by transfer equipment and one breakdown stops a number of other machines.

The earnings of all-round machinists measure up well with other skilled factory workers in the different part of the country. The hourly rate in 1966 ranged from an average of $2.31 in South Carolina to $3.86 in California for maintenance machinists. Most machinists work a 40-hour week with extra pay for overtime. Work is indoors and usually fairly clean, well lighted and ventilated and noisy. The machinist must stand for long periods of time. Special shoes to reduce foot fatigue are helpful and special glasses for eye safety are required. The usual paid holidays and vacations, life, medical, and accident insurance and pension plans are usually available to all machinists.

A four-year apprenticeship program is thought to be the best way to learn the machinist trade. As with some of the other trades, some skilled machinists learn the trade over the years by various experiences in machining jobs. Some companies provide machinists training programs for employees with completion in less than four years.

A machinist apprenticeship of four years has 8,000 hours of shop training and about 570 hours of related classroom instruction. Shop training covers learning the operation of various types of machine tools. Hand operations such as chipping, filing, hand tapping, dowel fitting and riveting are taught. Classroom work covers blueprint reading, mechanical drawing and shop practices.

Interest in becoming a machinist, mechanical inclination, and aptitude for highly accurate work requiring concentration and physical effort are needed for this work. A machinist also needs good vision, superior judgment of depth and distance and a high degree of finger and arm dexterity. High school or vocational school is desired preparation and required by many employers. Courses in mathematics, physics, mechanical drawing and machine shop and a knowledge of electronics and hydraulics are helpful during and after apprenticeship and are required of some experienced machinists at company expense so they can service and operate the numerically controlled machine tools now coming into greater use.

A machinist often starts off by operating a single type of machine tool. Further assignments on jobs may require him to operate several types of machine tools and hand operation. All-round machinists may advance to foreman or other supervisory jobs. Additional training can lead to becoming a tool or instrument maker, experimental and design

worker, process planner or estimator. There are other opportunities to advance to technical jobs in machine programming and tooling. A machinist may also open his own machine shop.

The all-round machinist plays a vital role in the industrial machining world. His job is one of a family or cluster of jobs or occupations to be found within the classification of metal machining and metal working or the title "Machine Operations" as used by the Occupational Outlook Handbook. The jobs which are included in the family or cluster of occupations are: (1) All-Round Machinist, (2) Machine Tool Operators, (3) Tool and Die Makers, (4) Instrument Makers, (5) Set-Up Men for Machine Tools, and (6) Lay-Out men. Films about these other jobs are available as well as additional information from your guidance counselor or teacher.

OCCUPATIONAL FILM EVALUATION FORM

Film Title:_____

Occupation:_____

Running Time:_____ Date of Evaluation:_____

Name and Title of Evaluator:_____

_____

Part I: Content - The film should illustrate information in the following areas: (Check the most appropriate description of each item below: A - Adequate; I - Inadequate.)

A	I		
___	___	1.	Activities and duties of the worker.
___	___	2.	Job setting or environment of the work.
___	___	3.	Qualifications and preparations required (education and/or training).
___	___	4.	Personal rewards (of the occupation) to the worker.
___	___	5.	Opportunities for advancement to higher levels in this occupation.

Part II: Style and Format - Check the most appropriate description.

A	I		
___	___	1.	Length of film.
___	___	2.	Implications for motivating students.
___	___	3.	Basic information for students (related to the world of work).
___	___	4.	Structure of film (organization, editing, continuity).
___	___	5.	Picture quality (clarity, framing, color, etc.).
___	___	6.	Sound quality (audiobility, voice, music, effects).

Part III: Recommendations

A. Recommended age - grade level: Check all spaces below that are appropriate. If you check "special," specify the nature of the group under "B"

_____Primary (1-3)	_____Jr. High School (7-9)	_____Special
_____Intermediate (4-6)	_____Senior High (9-12)	_____Adult
_____Middle School (5-9)	_____Disadvantaged students	_____College

B. Comments or general impression (note here special points you wish to mention and a brief statement of how the film affects you).

C. Please indicate your estimate of this film (Check one).

_____Highly Recommended	_____Useful
_____Recommended	_____Poor

D. If recommended, what applications are indicated?

E. If not recommended, what changes are suggested?

STUDENT FILM EVALUATION FORM

Film Title_____

Occupation_____

Evaluated by_____ Date_____

Age_____ Year in school_____ Class_____

You have just looked at a short film on an occupation. Please rate it according to the statements listed below:

	YES	NO	UNDECIDED
1. Was the setting of the job shown in this film?	____	____	____
2. Were the training and experience necessary to successfully perform in this occupation described?	____	____	____
3. Was information given concerning the educational preparations necessary for this job?	____	____	____
4. Was information given on the employment opportunities?	____	____	____
5. Was information given about the future outlook of this occupation?	____	____	____
6. Was the film long enough to show what you wanted to know about this occupation?	____	____	____

7. This film as a method for individualizing instruction on career information was (check the appropriate rating):
_____Excellent _____Good _____Fair _____Poor

8. This film as a method of learning about occupations was (check the appropriate rating):
_____Excellent _____Good _____Fair _____Poor

9. Mark the spaces listed if you have learned about occupations by any of the following methods:
_____Written materials _____Slides _____Film Strips ____Records

10. In the space below, please describe your feelings about the use of this film as a method of learning about occupations.

Appendix III

Available Resource Materials for Production of Films

Representative Film Laboratories Providing Film Reduction and Duplication Services

Single Concept Occupational Films Developed in Super 8 Cartridge Format

AVAILABLE RESOURCE MATERIALS FOR PRODUCTION OF FILMS

Eastman Kodak Company. Better Movies in Minutes, Publication AD-4. Eastman Kodak Company, Rochester, New York.

Pamphlets

Technicolor. "Sound Film Loop Source Directory." Technicolor, Inc., 1300 Frawley Drive, Costo Mesa, Cal., 1968.

The following pamphlets are available from Eastman Kodak Company, Rochester, New York, Consumer Markets Division:

Sources of Motion Picture Services and Equipment. 16MM, 8MM and Super 8 Publication AD-20.

Handling Super 8 Movie Film Publication AD-28.

Getting the Most Out of Your 8MM Film Publication AD-21.

Editing Your Movies Publication AD-26.

Care of Processed Kodachrome Movies AD-29.

A Comparison of Running Times and Formats of 8MM, Super 8, and 16MM Motion Picture Films Pamphlet S-42.

Super 8 Films for Original Production Pamphlet No. S-37.

Super 8 Film Source Guide Pamphlet No. S-35.

A Note on the Use of Super 8 Film and Equipment for Original Production Pamphlet No. S-14.

REPRESENTATIVE FILM LABORATORIES PROVIDING FILM REDUCTION AND DUPLICATION SERVICES

A-V Corporation
2518 North Blvd.
Post Office Box 66824
Houston, Texas 77006

Calvin Productions, Inc.
1105 Truman Road
Kansas City, Missouri 64106

Cine Magnetics, Inc.
202 East 44th Street
New York, New York 10017

Consolidated Film Industries
959 Seward Street
Hollywood, California 90038

Hollywood Valley Film Laboratories, Inc.
2704 West Olive
Burbank, California

Motion Pictures Laboratories, Inc.
781 South Main Street
Memphis, Tennessee 38102

Movielab, Inc.
Movielab Building
619 West 54th Street
New York, New York 10019

Palmer Film Services, Inc.
611 Howard Street
San Francisco, California

Parth Cine Laboratory
Mount Pocono,
Pennsylvania

Superior Bulk Film Company
442 North Wells Street
Chicago, Illinois

SINGLE CONCEPT OCCUPATIONAL FILMS
DEVELOPED IN SUPER 8 CARTRIDGE FORMAT

1. All Round Machinist
*2. Automobile Mechanic (Diagnostician)
3. Bricklayer
4. Carpenter
5. Computer Programmer
6. Construction Electrician
7. Cosmetic Sales Clerk
8. Cosmetologist
9. Dental Assistant
10. Dental Technician
11. Dental Hygienist
12. Executive Secretary
13. Heavy Operating Engineer
*14. Legal Secretary
15. Licensed Practical Nurse
*16. Medical Secretary
17. Over-the-Road Truck Driver
18. Sales Clerk, Clothing
19. Sales Clerk, Jewelry
*20. Secretary (State Agency)
*21. Tool and Die Maker (Machinist)

* Scripts Not Available

Appendix IV

Educators in Mississippi Participating in the Evaluation

PARTICIPATING EDUCATORS, MISSISSIPPI

Dr. J. Alcorn, Chairman and Professor of Guidance, University of Southern Mississippi

Dr. J. Daniels, Associate Professor of Guidance, University of Southern Mississippi

C. E. Spraberry, Assistant State Supervisor of Occupational Orientation

Teachers, Jones County

J. T. Breland, Occupational Orientation
J. Cecil Burt, Occupational Orientation
Gretchen Cockersham
Robert L. Davidson, Occupational Orientation
Charles R. Davis, Occupational Orientation
Dwight Harrison, Occupational Orientation
Malcom Lockwood, Occupational Orientation
Gladys Jo Ridgeway, Consumer Home Economics
Frank Risher, Occupational Orientation
James E. Thomas, Occupational Orientation and Industrial Arts
Nelda S. Turner, Occupational Orientation
Mrs. Kathleen Wade, Remedial Teacher

Administrators, Jones County

J. R. Fails, Coordinator, Education, Placement, Follow-up
R. T. Ishee, Local Project Director, Exemplary Programs
Norland Jeffcoat, Coordinator, Coop. Program
K. Morris, Coordinator, Guidance
C. S. Wade, Coordinator, Occupational Orientation